SMELT WORKING GROUP
Monday, March 15, 2010

Recommendation for the week of March 15, 2010

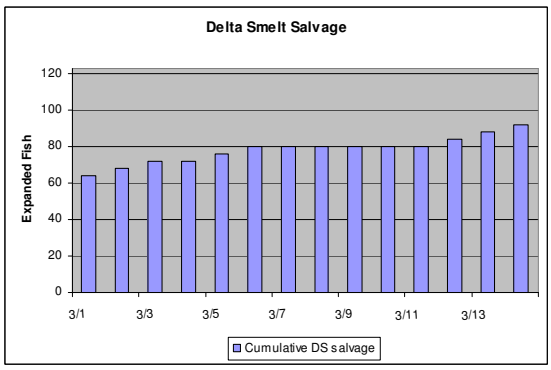
The SWG recommended OMR flows no more negative than -3,000 cfs. The Working Group agreed that -3,000 cfs would provide the optimal OMR flow to reduce the risk of adult delta smelt entrainment, and potentially avoid exceeding the authorized take limit of 123 fish before March 31. The Working Group felt that this level of OMR flow also would be adequately protective of larval delta smelt this week. The Working Group will continue to monitor salvage, survey data, and hydrological conditions and reconvene March 22.

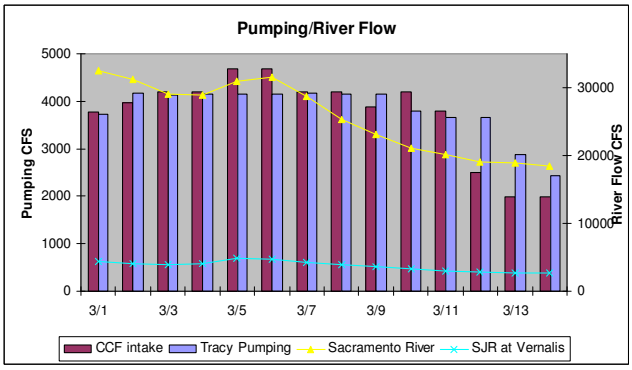
1) Current environmental data.

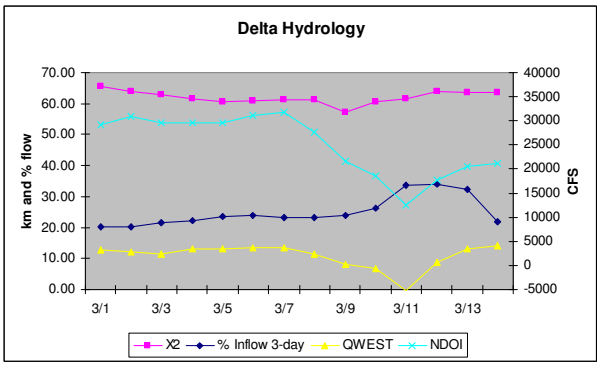
- **Water temperature** for the 3 station average is 12.5°C.

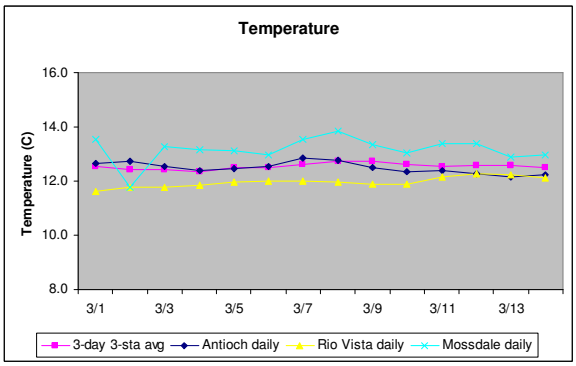
- **OMR**: USGS 14-day and 5-day tidally-averaged OMR as of March 12 is, respectively, -4,715 cfs and -4,956 cfs. The 14-day and 5-day OMR average estimate from CDEC as of March 14 is, respectively, -4,750 cfs and -4,171 cfs.

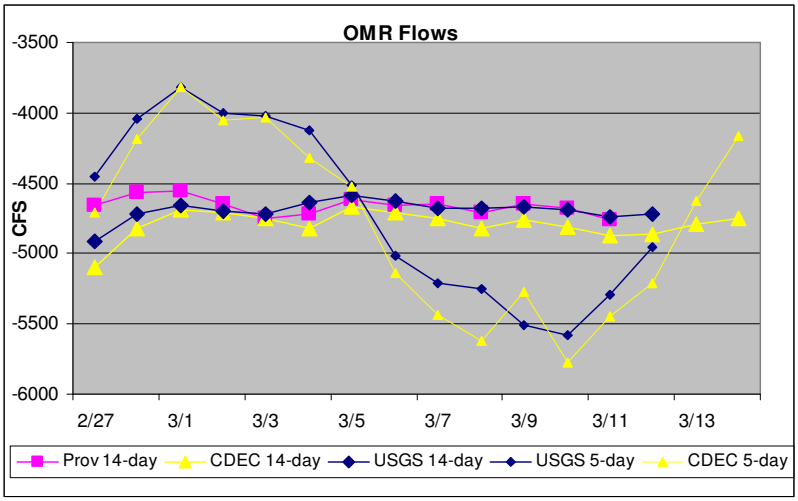
- **Flow:** Sacramento River inflow is 18,372 cfs and San Joaquin 2,607 cfs. The E/I ratio is 21.9%, X_2 is 63.57km, QWEST is 4,116 cfs and NDOI is 21,203 cfs. The graphs below show the most recent trends in delta smelt salvage, Delta hydrology, and water quality that were evaluated by the Working Group.











2) Delta fish monitoring:

Spring Kodiak Trawl #3 was in the field March 8 through 11. Results indicate a total of 78 delta smelt were collected from 10 stations, with the highest densities found in the Sacramento Deep Water Shipping Channel (SDWSC) and Cache Slough. A total of 48 females were collected: 14 were pre-spawn, 19 were ripe, and 15 were found to be spent. All spent females were collected in the SDWSC and were developing secondary ovaries. No delta smelt were collected from the stations in the central and south Delta. The 20mm Survey begins today. Results from larval surveys and the SKT are available online at: http://www.delta.dfg.ca.gov/delta.

3) Salvage

As of March 14, salvage has reached the concern level of 92. The provisional numbers, expanded, are:

	SWP	CVP
March 1	8	8
March 2	0	4
March 3	4	0
March 4	0	0
March 5	0	4
March 6	0	4
March 7	0	0
March 8	0	0
March 9	0	0
March 10	0	0
March 11	0	0
March 12	0	4
March 13	0	4
March 14	4	0
Total	16	28

This brought the cumulative total adult salvage to 92 as of the time of the call. The total authorized take for adults under the Biological Opinion is 123, cumulative, for the season.

Larval sampling is ongoing at the CVP and SWP facilities. No longfin or delta smelt larvae have thus far been salvaged this season.

4) Expected Project Operations

The Projects expect to manage exports to maintain an OMR flow no more negative than -5,000 cfs. Combined exports are at 5,000 cfs today and are expected to drop to 4,500 cfs tomorrow. Operators did not know what the expected pumping levels would be after March 16, although they noted OMR levels are being watched and pumping levels will be adjusted as needed to maintain -5,000 cfs OMR.

5) Particle Tracking Modeling

PTM was not requested or discussed for this week. PTM was not requested for next week, although the Working Group noted that they may request PTM next week to discuss at the March 29 SWG call.

6) Discussion for Recommendation

The Working Group reviewed and discussed all relevant data from fish surveys, Delta monitoring, salvage, and planned Project operations.

Delta temperatures have exceeded 12^0C since February 14 and egg size in salvage- and survey-collected females is approximately 1 mm in diameter. Spent females were collected in SKT #3. Therefore, the juvenile protective phase of the biological opinion (RPA Component 2; Action 3 in Attachment B) is in effect. This action will continue until June 30 or when the 3-day mean water temperature at Clifton Court Forebay reaches 25^0C, whichever occurs earlier.

Component 2, Action 3 of the biological opinion, which is intended to protect larvae and juvenile delta smelt, includes a range of OMR flow from -1,250 cfs to -5,000 cfs. The BO provides guidance for the assessment of the risk of entrainment of larvae and juveniles and for determining the appropriately-protective OMR flows within that range for any given week. The BO (pp 353-354) specifies that if entrainment risk is low, OMR flows could be expected to remain as negative as -5,000 cfs, but if entrainment risk is higher, OMR flows would be set so as to reduce that risk. The risk factors are (1) evidence (i.e., from survey data) that delta smelt are present in the South or Central Delta, and (2) evidence of ongoing entrainment. Because the Working Group believes hatching is just getting underway and that few larvae are present in the system, combined with the current hydrological conditions, it remains appropriate to consider the low-entrainment risk scenario.

The Working Group discussed the status of spawning. Results from the SKT #3 indicate that spawning is underway (spent females); of the 48 females collected, 14 were stage 3, 19 were stage 4 (ripe) and 15 were stage 6 (spent). The highest detected densities of adults are centered in

the SDWSC and Cache Slough. Adult delta smelt exhibited an apparent shift in geographic distribution of adults as indicated by the SKT #3 (as compared to earlier SKT) from the Suisun area to the northwestern Delta. Noting the proportion of pre-spawning to spent females, the Working Group felt that a sizeable number of adults are still awaiting spawning. The Working Group noted that although no delta smelt were detected by SKT #3 in the central and south Delta, the survey technique may not be as effective in collecting delta smelt if surface waters in the central and south Delta are less turbid waters than deeper water because the trawl tends to sample the surface layers. Delta smelt may be making their way to the export facilities by inhabiting those deeper layers.

The Working Group noted that in general, more positive OMR flows lessen the chance of entrainment for delta smelt. The trend in salvage since March 1 has been 3.1 fish (expanded) per day. If this trend in salvage continues, the Projects will reach their authorized take limit in approximately 10 days. The Working Group noted that PTM suggests that for every 1,000 cfs decrease (i.e., adjusted in a more positive direction) in OMR flows, there is generally a corresponding decrease in entrainment from station 815 by about 50% (see attached PTM run). Based on this generalization of entrainment risk from the central delta, adjusting OMR to -3,000 cfs, is likely to reduce the rate of salvage and minimize the likelihood that the take limit is reached or exceeded before March 31.

Historical data show that salvage of adult delta smelt often tapers off significantly by mid-March, but this pattern is highly variable, and salvage has often continued into early April. Nevertheless, if salvage continues as it has since March 1, the adult authorized take level will be met or exceeded before the end of the month. The Working Group expects salvage of adult delta smelt to continue, due to the apparent continued migration and continued low numbers of salvage. The Working Group plans to reconvene should salvage not decrease as expected after implementation of the new OMR flow of -3,000 cfs.

Next Meeting: Monday, March 22, 2010 at 10 am

WEEKLY ADVICE FOR THE DEPARTMENT OF FISH AND GAME FOR LONGFIN SMELT

Advice for week of March 15:
The Smelt Working Group believes that OMR advice of -3,000 cfs for delta smelt will provide protection for longfin smelt**.**

Basis for advice:
The 2009 State Water Project 2081 for longfin smelt states that advice to the DFG Director shall be based on:

1. Adult Salvage – total adult (>=80mm) longfin smelt expanded salvage (SWP+CVP) for December through February > 5 times the Fall Midwater Trawl longfin smelt annual abundance index.

2. Adult abundance, distribution or other information indicates that OMR flow advice is warranted.

3. Larva distribution in the Smelt Larva Survey or the 20mm Survey finds longfin smelt larvae present at 8 of 12 Central and South Delta sampling stations in 1 survey (809, 812, 815, 901, 902, 906, 910, 912, 914, 915, 918, 919).

4. Larva catch per tow exceeds 15 longfin smelt larvae or juveniles at 4 or more of the 12 survey stations listed.

Current Information

No adult longfin smelt were salvaged in the past week and none have been salvaged since the December 1, 2009 criterion period for salvage began. Adult longfin smelt have only rarely been salvaged after mid-February.

No adult longfin smelt were collected upstream of the confluence by Bay Study in March.

On March 1-2, longfin smelt larvae were found at only 6 of 12 south and central Delta criteria stations during the fifth Smelt Larva Survey, and catches at these stations declined from Survey 4 (Table 1). During Survey 4, total catch at the central/south Delta criteria stations represented about 1% of the longfin smelt larvae caught based on complete processing. During survey 5 the longfin smelt density distribution peaked in western Suisun Bay. Since survey 5 outflows and positive Qwest (see Delta Hydrologic Conditions March 15; http://www.water.ca.gov/swp/operationscontrol/deltaops.cfm) probably continued to move longfin smelt larvae out of the Delta and away from risk of entrainment in Delta diversions.

Discussion

The distribution information above was used to develop OMR flow advice. Smelt Larva Survey #5 data indicate a continued reduction in longfin smelt larva numbers in the Delta (Table1). Neither the presence (8 of 12 stations) or density criteria were met for Survey 5, though the larva criteria trigger occurred as a result of SLS Survey 2 and outflow has been insufficient to reset triggers. Based on a larva/juvenile trigger, advice can restrict OMR flow levels to between -1,250 and -5,000 cfs on a 14-day running average and the 5-day running average is within 25 percent of the required OMR flow. Outflows did not reach trigger re-set thresholds (55,000 cfs for Sacramento River at Rio Vista; 8,000 for San Joaquin River at Vernalis), but outflows were recently increasing in both rivers (see Figure 1 and 2 below). Qwest has been positive through February except for a few days from February 19 through the 23 and March 10-11, and has been positive recently (Delta Hydrologic Conditions March 15; http://www.water.ca.gov/swp/operationscontrol/deltaops.cfm). A positive Qwest indicates net flow was likely to transport of longfin smelt larvae from the San Joaquin River and Franks Tract portion of the south Delta westward toward the confluence, reducing their risk of entrainment.

Only a small fraction of the longfin smelt larvae (ca 1% based on survey 4 results) was believed to be vulnerable to entrainment into the south Delta as long as OMR did not increase substantially. Larva numbers in the central and south Delta stations declined between surveys 4 and 5. Longfin smelt larva center of density was well west of the confluence (http://www.dfg.ca.gov/delta/data/sls/CPUE_map.asp) and density peaked at station 418 in western Suisun Bay.

Particle tracking model output was not reviewed for this advice.

Figure 1. Tidally averaged discharge for Sacramento River at Rio Vista, posted as of March 15, 2010.

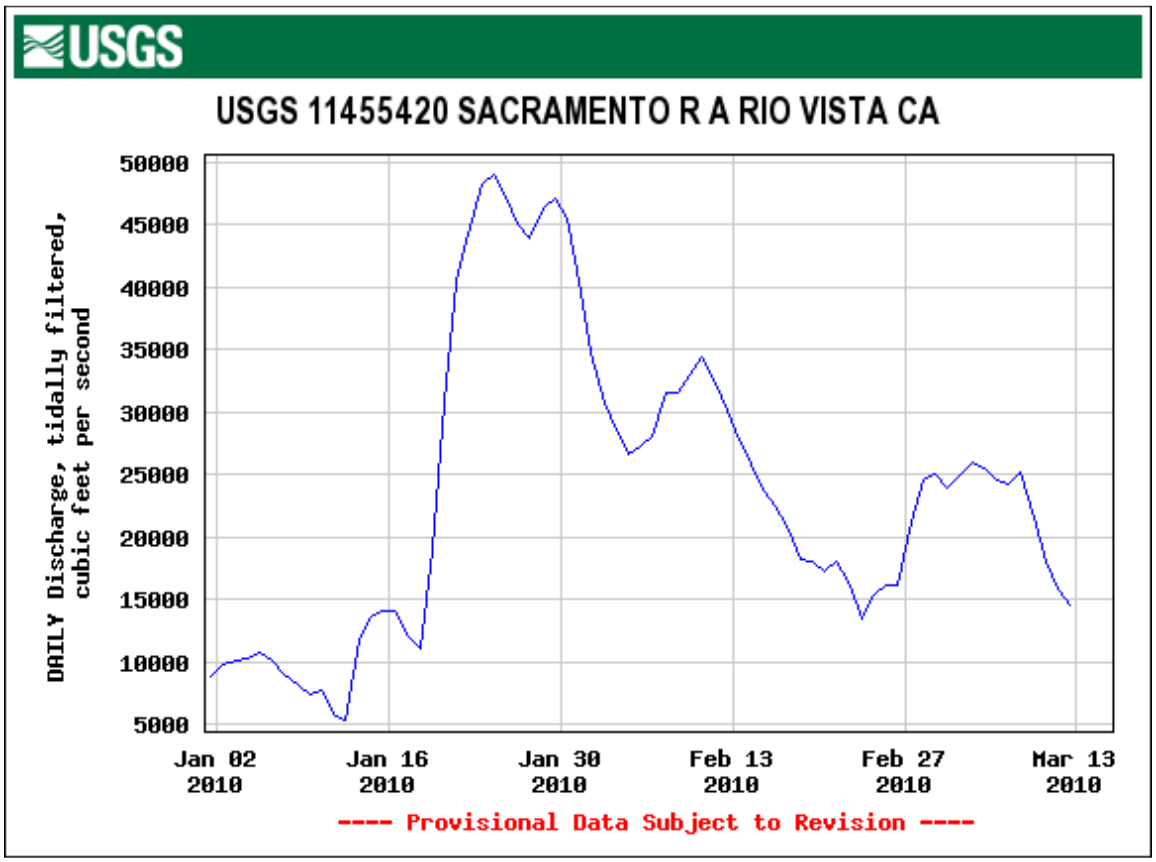


Table 1. Longfin smelt total catch by station for Smelt Larva Survey #5, March 1-2, 2010; samples processed through Wednesday March 3 only. Criteria stations for the State Water Project ITP are shaded. See web site for complete data--
http://www.dfg.ca.gov/delta/data/sls/CPUE_map.asp

Year	Survey	SLS Station	Sample Status	Species	Smelt Catch
2010	5	405	Not yet processed		
2010	5	411	Not yet processed		
2010	5	418	Not yet processed		
2010	5	501	Not yet processed		
2010	5	504	Not yet processed		
2010	5	508	Processed	Longfin Smelt	20
2010	5	513	Processed	Longfin Smelt	12
2010	5	519	Not yet processed		
2010	5	520	Processed	Longfin Smelt	27
2010	5	602	Not yet processed		
2010	5	606	Not yet processed		
2010	5	609	Not yet processed		
2010	5	610	Not yet processed		
2010	5	703	Processed	Longfin Smelt	25
2010	5	704	Processed	Longfin Smelt	16
2010	5	705	Processed	Longfin Smelt	15
2010	5	706	Not yet processed		
2010	5	707	Processed	Longfin Smelt	15
2010	5	711	Processed	Longfin Smelt	3
2010	5	716	Processed	Longfin Smelt	7
2010	5	723	Processed	Longfin Smelt	16
2010	5	801	Processed	Longfin Smelt	26
2010	5	804	Processed	Longfin Smelt	27
2010	5	809	Processed	Longfin Smelt	19
2010	5	812	Processed	Longfin Smelt	6
2010	5	815	Processed	Longfin Smelt	1
2010	5	901	Processed	Longfin Smelt	5
2010	5	902	Processed	Longfin Smelt	1
2010	5	906	Processed		No Smelt Catch
2010	5	910	Processed		No Smelt Catch
2010	5	912	Processed		No Smelt Catch
2010	5	914	Processed		No Smelt Catch
2010	5	915	Processed		No Smelt Catch
2010	5	918	Processed	Longfin Smelt	1
2010	5	919	Processed		No Smelt Catch

SWP ITP Criteria Stations

Processing as of 3/3/10.